30 JUL 1939

MADRAS

JOURNAL OF SOUTH INDIAN MEDICINE.

(*Incorporating the Bulletin of the South Indian Medical Union*).

VOL. VI JULY 1939 No. 4

A STUDY OF TUBERCULOUS DISEASE OF THE JOINTS INCLUDING SPINE IN MADRAS. *

BY

N. S. NARASIMHAN, F.R.C.S. (England & Ireland),
(*Orthopaedic Surgeon, General Hospital, Madras*)

It is the feeling of every doctor that tuberculous disease of joints must be diagnosed early, efficiently and continuously treated adequately, and that a watchful after-treatment is essential.

The co-operation of the family doctor, nurse, midwife, the Surgeon, and the Radiologist is essential.

The following study will be of some value in understanding the types of cases that are being met with in Madras.

ANALYSIS OF THE CASES STUDIED :—

Tuberculosis of Bones and Joints (Excluding spine).

Total ... ... 106 cases.

Distribution is as follows :—

(*A*) Males 74, Females 32 ... 106

(*B*) 1.	Shoulder	3	6.	Hip	35
2.	Elbow	18	7.	Knee	19
3.	Wrist and carpal bones	14	8.	Ankle (including talus)	8
4.	Dactylitis (Spina Ventosa)	1	9.	Tarsal bones	3
5.	Sacroiliac joints	4	10.	Rib	1

* Lecture delivered under the auspices of the Dr. Elizabeth Mathai Endowment 1938-39 for the Madras University.

1. *Shoulder* :—3

Right	2	Males	2
Left	1	Female	1

Age :	1—10	10—20	20—30
	0	2	1

Sites affected and types :—

Head of humerus	...	...	1
Humerus and Glenoid Cavity		...	1
Caries Sicca	...	...	1

2. *Elbow* :—18 cases.

Right	13	Males	11
Left	4	Females	7
Bilateral	1		

In 2 cases it was ***multiple***. There was tuberculous disease of the ***Right Elbow*** and ***Left hip*** in a girl of 7 years and in the other tuberculosis of the ***Right Elbow*** was associated with disease of the ***left knee*** in a male of 30 years.

Age:	1—5	5—10	10—20	20—30	30—40	Above
	1	2	4	10	1	0

Types :—

Synovial	...	...	...	6
Osseous	...	...	...	12

Osseous Type—12 :—Bones affected were as follows :

1. All bones of the Elbow joint ... 3
2. Lower end of humerus ... 3
3. Upper end of ulna ... 2
4. Upper end of Radius (head) ... 0
5. Lower end humerus and upper end of ulna ... 3
6. Head of radius and upper end of ulna ... 1

Upper end of Ulna :—(6)

1. Olecranon ... 1
2. Coronoid Process ... 1
3. Lesser sigmoid ... 1
4. Greater sigmoid ... 3

I should draw the attention of the readers to the statement made in the Rose and Carles (Edition 1937—Page 747, Volume I under Tuberculous disease of the elbow. "The disease is most common in young adults, commencing usually in the Synovial membrane, especially that of the superior radio-ulnar articulation; the swollen synovial membrane bulges on either side of the olecranon and the tendon of the biceps, and can often be felt over the head of the radius, and the joint presents the typical appearance of white swelling." This is a clinical appearance in the advanced cases in adults but this is not in accord with our findings here or with the findings mentioned in the other text books.

In page 741 of Vol. I of Rose and Carles the following statement occurs, "Tuberculous disease of joints :—In children the disease commences most frequently in the epiphysis *about equal frequency* whilst in adults it may start in membrane or bone."

Boyd " It is a disease of children : it is usually secondary to tuberculosis of adjacent bone ; in the adult it is synovial in type ; bone tuberculosis has a strong tendency to spread to the corresponding joint ".

3. *Wrist* :—14 cases { Males 10, Females 4 }

Right	8
Left	5
Bilateral	1

Age :	1—10	10—20	20—30	30—40	40—50	Above 50
	0	1	6	3	2	2

Types and Sites :—

1.	Synovial type	4
2.	Wrist, carpal bones and lower ends of radius and ulna	2
3.	Wrist, carpal bones and inferior radio-ulnar joint	2
4.	Wrist and carpal bones	3
5.	Wrist and interphalangeal joints	2
6.	Only lower end of ulna	1
		14
7.	Wrist and hip joints. 1. (both right—25-F)	

The two cases associated with the interphalangeal joint lesions were on the right side. One is a female of 27 years with disease of the proximal

interphalangeal joint of the ring finger and the other is a male of 30 years with involvement of the distal interphalangeal joint of the middle finger.

In one case, female of 25 years, tuberculous disease of the right wrist was associated with disease of the hip joint of the right side.

4. *Dactylitis*:—1 case - 25 years - male - with tuberculosis of the left knee.

5. *Sacroiliac joints* :—4 cases { Male 2, Female 2 }

In two cases the disease was bilateral. One was a 5 years old female child and the other an adult of 30 years. In the latter there was a tuberculous carious condition of the left ileum.

6. *Hip* :—35 { Males 24, Females 11 } Right 18, Left 17

Age:	1—5	5—10	10—20	20—30	30—40	Above 40
	13	7	9	4	2	0

(Minimum age noted $1\frac{1}{2}$ years.)

Types :—

Early	1		
Synovial	7		
Osseous	27 -	Head	8
		Neck	3
		Acetabulum	10
		Greater trochanter	2
		Head and Acetabulum	4
			27

Of these :—

Pathological dislocation	3
Travelling acetabulam	7
Protrusio acetabuli	2

2 cases had *cold abscess*.

Clinical diagnosis of tuberculous disease of the hip is often difficult in the very early stages: a good radiogram shows changes in the metaphyseal region even in early stages.

Transitory arthritis of the hip joint, osteo-chondritis of the hips (Perthes's) disease, old suppurative arthritis, Coxa Vara due to old injuries which may not be recollected are to be excluded.

The word Protrusio-acetabuli may not be familiar to many. It is a well described condition often not recognised.

I have now noted these changes in two cases of hip joint disease under observation for the past six years.

In 2 cases other joints were also affected. In one case, a 25 years female *Right hip* disease was associated with *T. B. of the Right wrist.* Another case a 35 years female there was disease of the left hip with travelling acetabulum and *disease of the right elbow.*

In one case, a female - 13 years, the *head was forked* with partial absorption and a travelling acetabulum.

In another case an adult male of 20 years with disease of the left hip with travelling acetabulum, there was *paresis* of both the lower limbs.

There was one case with a *history of trauma* 6 months ago and there was tuberculosis of the right hip commencing in the greater trochanter.

7. *Knee* :—19 cases { Male 15, Female 4 }

Right	9
Left	9
Bilateral	1

	1—5	5—10	10—20	20—30	30—40	Above 40
Age :	5	2	5	4	2	1

Minimum age 4 years.

Types :—

Synovial	8
Osseous	11

Condyles of femur affected	5
Condyles of tibia	2
Articular cartilage eroded	4

In one case in an adult male of 20 years of age with a tuberculous Synovitis of the left knee there was osteoporosis *of the patella.*

Two cases were associated with lesions of other joints. In one case an adult male of 25 years there was a *tubercular dactylitis.* In another male of 30 years with disease of the left knee, the right elbow was also affected. In one case there was a *disease of the lung of a fibrotic* nature.

In a large outpatient department or one's own clinic one must be on the alert to spot the early cases: A working rule would be "A mono-articular affection of a large joint which is persistently warm on repeated examinations is tuberculous."

Other chronic affections of knee joint are extremely common as recurrent effusions of the knee due to repeated trauma and occupational conditions. Wasting of the quadriceps is a very early sign in most cases of any affection of the knee hence greater care is required to spot cases of tubercle knee in the early stages.

Senile tuberculosis of the knee does occur; this has to be differentiated from osteo-arthritis of the knee.

8. *Ankle including talus:* 8. Right 3 *Males* 7
Left 5 Female 1

	1—5	5—10	10—20	20—30	30—40	Above 40
Age:	1	0	2	2	3	0

Minimum age 5 years.

Types: Synovial 2
Osseous 6

Osseous: —

1. All bones of ankle joint affected 4
2. Only talus affected 1
3. Lower end of the tibia (Metaphyseal) 1

Associated Lesions:—

In one case, 23, male, with disease of the left ankle the *astragalo-navicular joint* was also affected.

In another case, 40, male, there was disease of the left ankle associated with *open pulmonary tuberculosis.*

In one case, female, 19 years, the head of the left talus presented cystic changes with no involvement of the ankle joint *Osteitis tuberculosa cystica.*

In one case the whole talus had been diseased with *compression of the bone* as a result of weight bearing.

9. *Tarsal bones* :— 4

Male	1	Right	2
Female	3	Left	2

Age :	1—10	10—20	20—30	30—40
	0	2	0	2

Calcaneus 1—9 female; histology proved the lesion to be tuberculous.

Talus	1	10	Female
Talus and navicular	1	40	Female
Navicular alone	1	34	Male

TUBERCULOSIS OF JOINTS.

106 cases of Tuberculosis of joints were studied; age and sex incidence and the type as seen clinically and with radiographic study are presented below.

All infection occurs through blood stream. Primary focus is in the mesenteric glands. *Disease may appear in the infant.* All types of bone are involved. Primary infection is most common in the bone itself and less frequently in the joints; more boys than girls are affected. In this group actually 74 males and 32 females are affected.

In England the onset of arthritis is between the ages of 3 and 5 in 48% of cases; in 75% of cases first signs are noticed before the age of 14. This statement tallies in case of tubercle of hip here also but as regards other joints the age incidence noted here is higher. It may be that the large infant mortality is responsible for this age incidence as these children readily succumb.

Up to 6 years of age, the incidence in either sex is equal, above that age, 5 boys to 3 girls are affected. Sacro-iliac joint disease may occur in childhood; a few are affected at about 12; Hip is the commonest joint affected, next is knee and then elbow. In this group elbow cases are more than the knee cases.

Elbow affection is osseous in type in the majority of cases; cases may be mistaken for osteomyelitis; it begins primarily in the *greater sigmoid cavity* of the ulna. Tuberculous disease of the Shoulder is less common.

I think it is extremely difficult to diagnose tuberculosis of the shoulder. In a sputum positive case Xrays did not demonstrate much change in a tuberculous shoulder. In a case with sinuses the radiogram did not reveal any change. One case in a young man showed marked atrophy of the muscles, the sinus may be far away from the shoulder as in the middle of the arm or even lower down.

In ankle joint primary bone disease is common.

The early diagnosis of the tuberculous joint cases is important. *The following elementary signs and symptoms may be borne* in mind.

(*a*) If there is no limitation of movement, then there is no arthritis.

(*b*) If there is swelling, it means the synovial membrane is involved.

(*c*) Pain and (*d*) muscle atrophy or spasm are always present.

EARLY DIAGNOSIS OF TUBERCULOUS DISEASE OF JOINTS.

I have realised that it is difficult to come to a certain conclusion in cases of affections of large joints. One must decide whether a joint has to be rested or not. A radiograph taken even a week after immobilization of a joint does show rarefaction. Therefore before a diagnosis is arrived at, a sub-acute or a chronic affection of a joint should not be immobilized. A slight rise of temperature taken in the mouth or rectum, local wasting of the muscle, continued warmth of the joint during repeated examinations, narrowing of the interarticular spaces in a skiagram, and a positive Mantoux test will enable the surgeon to come to a conclusion. It is difficult to prove the tuberculous nature by a positive finding. Many examinations of synovial fluid prove to be sterile and no T. B. has been recovered on guinea pig inoculation. In one instance of a hip joint case, and in two instances of the spine have T. B been found on guinea pig inoculation. There is generally an enlargement of the lymph gland draining the area. It is claimed by some authorities that biopsy of these glands has given more positive results. In three instances, the biopsy proved negative histologically and on guinea pig inoculation. In three instances ot synovectomy of early tuberculous disease, the synovial membrane was not histologically tuberculous. One of these, a case of T. B. of Elbow in a woman aged 31 kept under continued observation showed bony changes in the humerus and has developed a cold abscess in front of the sternum. Therefore, a biopsy of the synovial membrane and the lymph gland draining the area will not give a positive result in the early cases. If the disease has lasted for more than a year and a half, the histological examination of the synovial membrane has uniformly proved to be tuberculous.

Cold abscess.—The tubercle bacillus is found in only about 1/5 of these abscesses so that failure to find T. B. does not disprove the diagnosis.

Clinical judgment must remain supreme in the diagnosis of these cases.

Tuberculosis of the upper extremity differs from tuberculous affections of the lower extremity as follows:—

(1) Peculiarly slow and insidious.

(2) No pain is experienced until the disease is fully established.

(3) increasing stiffness of the joint and rigidity noticed.

(4) The average age of onset of the disease in the lower limb is 5 years while that of the upper limb is 8 to 9 years; the great disparity being due to the comparative frequency with which the joints in the upper limb are affected in the adult.

I know of two children aged 8 and one adolescent male aged 16 with elbow disease which is going on for 3 years without much destruction of bone; the elbow is swollen, warm and just limited in its movements.

A mother of a large family has her elbow affected for 5 years. The elbow is swollen and stiff, she would not hear of a diagnosis of tubercle of the joint.

PROPHYLAXIS OF BONE TUBERCULOSIS IN CHILDREN.

Both bovine and human tuberculosis could be stamped out in the young by insisting on effective control of Milk supply; and by separating a tuberculous parent from the offspring.

Bone tuberculosis seldom causes death ; when it does it is because of neglect or improper treatment or of multiple infections The mortality rate in multiple infections is 5 to 7% in western countries. The causes of death are

(*a*) Meningitis.

(*b*) Tubercle of Lungs.

(*c*) result of mixed infection.

The actual mortality rate in this province is much higher although I cannot give accurate figures. Mixed infection and multiple infections are common.

Treatment :—The Native bonesetter and the native Malabar system of treatment have no ideas of treating tuberculosis of joints. The cases are

subjected to massage and other measures. Early diagnosis is important. Treatment in a child should be entirely on conservative lines while in an adult in this country operative measures have to be undertaken at the appropriate optimum time after raising the general health of the patient; Recovery is a matter of months or years; at no time can any one say it is positively cured.

The conservative treatment consists of immobilisation of the joint which ensures complete, continued, uninterrupted rest in suitable splints with skin traction; This immobilisation must be continued until all pain and spasm pass off and re-calcification of the bones is fairly well advanced; In an average case with good health this takes 9 months to a year; the upper extremity cases are treated on ambulatory lines.

The general treatment consists of good nourishing food, eggs, cod liver oil, butter and residence in a sanatorium, or a hospital or the house in the most ventilated and well lit part of the house. Even in a poor house this continued immobilisation could be carried out. Most of my child patients are kept in their own houses in plaster of paris casts. The most important factor in the treatment is thorough immobilisation, both for children and adults. The practitioner must familiarise himself with the correct method of immobilisation of each joint.

Cold abscess may develop even under complete immobilisation.

Care of cold abscess.

(1) Intensify general care and sunshine.

(2) 70% of abscesses are absorbed without opening.

(3) If abscesses threaten to rupture, keep skin surgically clean.

- (*a*) Bathe with alcohol daily.
- (*b*) apply sterile gauze dressings over abscesses and surrounding skin.
- (*c*) do not at any time touch skin with unwashed hands.
- (*d*) use sterile instruments to clean skin.

(4) Aspiration.

- (*a*) Should be done with strict aseptic technique.
- (*b*) Needle should be inserted through good skin and not over point of threatened rupture.
- (*c*) *Do not squeeze abscess.*

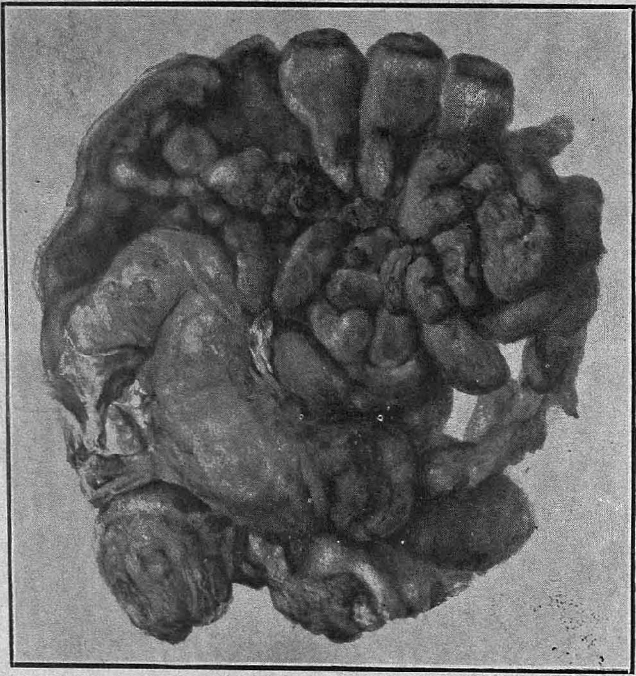
Muslim boy aged 14 ; under observation and treatment since 1932 ; Protrusion of the acetabulum has taken place since 1937.

Case of Tuberculosis of Left Hip.

30 JUL 1939

R—Hindu—aged 25—Tuberculosis Right hip—Extra-articular arthrodeisis by a large ileal graft—one year and four months after operation : The graft has consolidated satisfactorily.

CONNEMARA PUBLIC LIBRARY
30 JUL 1939
MADRAS



M—Hindu—20—Tuberculous synovial membrane--histologically positive ; repeated guinea pig inoculations proved negative.

(5) If abscess ruptures.

(*a*) use sterile rubber gloves when dressing wound.

(*b*) use sterile towels and strict aseptic technique for dressing.

In adults when they are showing signs of recovery as judged by freedom from pain, pyrexia, recalcification, increase of weight, which take a year, some method of arthrodesis has to be done. For the shoulder, the site of infection is the head of the humerus and extra-articular arthrodeisis is not enough. Jones's method of arthorodeisis is done; two cases were done this year. *For the elbow an excision is done before the peri-articular tissues are* involved and when there are no sinuses. 4 cases were treated with excision during the year. Sinuses would call for an amputation in poor people Wrist is better treated by conservative measures only; curettage or excision should not be done.

For the Hip Joint an extra-articular arthrodeisis by a large bone graft slid down from the iliac bone and secured to the greater trochanter produces a sound ankylosis.

Two cases were done during the year.

Knee requires a complete arthrectomy and a modified excision (Jones's technique); four cases were operated on in the year.

Ankle joint does not tolerate plaster of paris; there is a tendency for sinus formation. Jones crab splint is good for conservative treatment; arthrodeisis for one late case was done during the year.

Tubercle *of the tarsal* bones in adults requires excision of the single bone *as part of* calcaneus, complete removal of talus or navicular or cuneiforms. Anterior tarsectomy was required in a middle-aged man. Disease of the metatarcapals, metatarsals, phalanges are treated by excision of the diseased bone. The prognosis is good in these cases.

Tuberculosis of the sacro-iliac joint requires special mention here. Early diagnosis is difficult; No reliance must be placed on Erichsen's sign i.e., pain elicited on attempting to separate the two iliac bones or on pressure over the anterior superior spines. Two cases were diagnosed early and were treated by immobilisation; one of these cases was complicated by a B. Coli infection of the kidneys; the other one was in a medical ward.

The other two cases had been discharged from the medical wards of a hospital. They were treated by a fixation or fusion operation; if sinuses

form they will die after a prolonged illness after 4 to 5 years. A sinus may form anteriorly lateral to the femoral artery and the ilio-psoas bursa, the Sacro-iliac joint, may be infected with secondary involvement of the hip joint. It is found frequently in the adult as well as in the child. The children as well could be operated.

The accompanying statement shows the operations performed.

The After-Treatment must be continuous till sound ankylosis takes place; a continued after-care also is essential.

Tubercle Shoulder.

S.	17	M	H	Right Jones arthrodeisis 28/1 and 2/2/.
	30	F	H	Left 23/12/38.

T. B. Hip.

R.	29	M	H	T. B. Right. Extra articular arthrodeisis 23/2/38.

Radiogram in June 1939 shows good solid consolidation.

Annamalai	20	M	H	Soutters (Right) 8/4/ and 13/4. Extra articular arthrodeisis on 13/7/38.

Radiogram in May 1939 shows good consolidation.

T. B. of Ankle.

B.	38	F	H	T. B. ankle right 15/12 arthrodeisis.

T. B. Elbow.

M.	25	M	H	T. B. left *elbow* excision—subsequent amputation 9/3 and 19/3.
K.	30	F	H	T. B. elbow 7/4 and 11/4/38.
A.	35	M	I Ch.	T. B. Elbow 9/5.

Other joints.

M.	34	F	H	T. B. Ileum 11/3/38.
R.	9	FC	H	T.B. Calcaneus curetting; 19/3 and 28/3
A.	39	M	H	T. B. Foot 30/5 anterior tarsectomy

Sacro-iliac joint.

S.	30	M	H	Smith Peterson method of fusion of of Right Sacro-iliac joint 7/3/39.

				Re-examination 26/6/39: good arthrodeisis. Patient is able to move about without pain.
R.	25	F	H	Smith Peterson method of fusion of Left Sacrô-iliac joint in January 1938 in case with sinuses posteriorly and anteriorly; sinuses still persist.

T. B. Knee.

Arthrodeisis of the knee by the Jones method is good: all the eight cases have consolidated well; This is done only in adults:

II.	POTTS DISEASE		116
	Sex Incidence	Males	79
		Females	37

	1—10	10—20	20—30	30—40	40—50	Above.
Age:—	46	19	24	12	5	9

Vertebrae affected:—Cervical	15
Dorsal	67
Lumbar	34

Of Dorsal—27 Lower dorsal region—*5 cases. Of these 22 cases* of these in XII dorsal and I L V. were affected.

There were two cases in which the intervertebral discs were not affected but the bodies of the vertebrae were carious. One was in an 8 year girl in which the 5th and 6th cervical vertebrae were affected. The other was in a 10 year girl in which the 2nd, 3rd and 4th L. V. were affected but the discs showed no change.

Deformity of the spine was present in 15 cases.

Of these:

Angular deformity	10 cases.
Kyphosis	4 cases.
Kyphoscolisis	1 case.

Nerve symptoms:—There were 2 cases with paraplegia. There was one case which was referred from the medical side as *Syringomyelia.*

60—M—H—in which 3rd, 4th and 5th cervical vertebra showed destruction. There was one case which came for pain in the back and was suspected to be a *spinal tumour.* With lipiodal no block was observed. The 12th Dorsal and I. L. V. showed tuberculous changes with paravertebral abscess.

Retention of Urine:—was the main complaint of the patient and the 10th and 11th D. V. showed tuberculous change. (30—M—H.)

Torticollis was observed in one case—2 year male child in which the VI cervical vertebra was affected.

Abscesses occurred in *35 cases.* The sites of the abscesses were as follows:—

Retropharyngeal—

Paravertebral (Lower dorsal region) 20 cases of which 3 were *mediastinal* abscesses.

Psoas abscesses 9

Perirenal abscess—1 case associated with psoas abscess 12th D and I. L. V. affected in an adult male.

Iliac:—4 cases.

Repeated examination of the abdomen by palpation will reveal many abscesses.

Associated Lesions:—

In three cases the *Hip joint* was involved. 2 of them showed definite tuberculous changes in the hip, while in one in a man, 30 years—where the 2nd and 3rd lumbar were affected, there was *osteoarthritis* of the left hip.

One case in which the 5th L. V. was affected showed involvement of the *sacroiliac joints* with a sinus in the groin—in an adult male.

There was one case in which the *head of the XII rib* showed destruction with pathological *separation of the transverse process of the I. L. V. on the left side* in an adult male with disease of 12 D. V. and I. L. V. and psoas and perirenal abscess.

There were 2 cases in *which the body of the V. L. V. showed a slipping forward* over the sacrum. One was in a 18 year old girl with disease of II, III and IV L. V.—The other was in an adult female with disease of the II, IV and V. L. V.

There was one case in which the *lump showed* areas of consolidation.

In one case, (42—female) there was disease in both the *dorsal region* (upper) and *lumbar region*—3rd and 4th.

Sequestrum was seen in one case of disease of the 4th and 5 cervical vertebrae—adult female.

Calcification—around the affected region was seen in 2 cases—both of them children. In both the mid-dorsal vertebrae were affected.

There were 3 cases with spondylitic changes of the elderly age type: Senile tuberculosis of the spine was met with in two instances.

OBSERVATIONS ON TUBERCULOUS DISEASE OF THE SPINE.

Tuberculous disease of the spine constitutes 45% of all tuberculous affections of joint The disease is commonest in children between 2 and 5 years of age; in this series 40% of cases occurred between 4 and 10 years of age: one case occurred before the age of 1. 116 cases are studied in this series—males 79 and females 37. This does not represent the actual condition of affairs. Only 5% of cases are diagnosed early enough; when I say early enough I mean the presence of a demonstrable bony lesion in a radiograph. All other cases come in advanced stages: during the year two Government servants who had been under constant treatment for backache and who have been radiographed came in with angular curvature in one case and another with a large paravertebral abscess. As Pott's disease is a local manifestation of a general disease the early symptoms may be general as loss of appetite, poor nutrition and tiring easily If one looks for signs and symptoms they are always present. Only in the case of the disease of the 5th lumbar vertebra difficulties in diagnosis ought to arise on account of the frequency of the anamolies in this region.

SEVERE PAIN IN THE EARLY STAGES IS UNCOMMON.

There may be disinclination for work, for play or they may be referred pain; referred pain in the epigastrium has been frequently mentioned in the book; but this is not so common; only in one case it was noted; on the other hand referred pain to the ear, shoulder to the side of the chest, appendicular region, gluteal region, legs and heel are fairly frequent.

A scheme for the examination of every spine case must be followed :—

(*a*) Movements of the spine are restricted on account of a spasm of the muscles.

(*b*) In a suspected case examine the various parts of the spine for limitation of motion.

N. B.—Very little flexion occurs in the dorsal region, and consequently the common test of forward flexion may easily fail to reveal a focus in the upper dorsal region. In such a case rotation will be diminished.

(c) Often the child may be brought for lateral curvature as the mother puts it; this lateral curvature is present nearly in 10% of cases; it may be passed on as scoliosis. This is not like the smooth curve of scoliosis but is more a leaning of the whole spine to one side above the lesion.

(*d*) Deformity may be the first symptom; (concertina collapse)

(*e*) Paraplegia may be the first symptom.

It may be mentioned that it is not necessary to examine by pressure on the spine or by a knock on the head. This method has been traditionally handed over; this may do damage to the bone.

If the disease is not recognised and treated abscess formation is almost the invariable rule. Affections of the 5th to the tenth dorsal vertebra cause 60% paraplegia. This is called the paraplegic area of the spine.

DIFFERENTIAL DIAGNOSIS.

(1) Appendicitis in children.

(2) Injury of the spine in children and adults (compression fracture).

(3) Tuberculosis of the sacro-iliac joints.

(4) Typhoid spine.

(5) Kyphosis in infants—The x-ray appearances may resemble those of tuberculosis. The anterior parts of the intervertebral discs may have disappeared and some narrowing of the anterior parts of the bodies of the contiguous vertebrae, producing the typical deformity; there is no decalcification, the anterior parts of the bodies may be fused together with some degree of sclerosis; this is probably congenital in origin and may be associated with congenital heart disease (Burns and Ellis).

(6) Osleo-chondritis of the spine (Calve's).

(7) Old unrecognised compression fractures of the spine.

(8) New growth in adults.

(*a*) *Primary.*

One case of primary sarcoma from the spinous processes of the cervical vertebrae was seen with Quadruplegia in a man of 35: Pain was excruciating; there was a large bilateral swelling on either side of the middle line. Radiogram revealed destruction of several spinous processes.

A child of three was brought into hospital with paraplegia of sudden onset; there was an obvious swelling on either side of the middle line at the lower dorsal region. A biopsy proved it to be a sarcoma.

(*b*) Secondaries from breast, thyroid, kidney, etc.

(9) Spinal tumour syndrome in cases of posterior lesions of the body of the vertebra.

(10) Aneurysm of thoracic aorta—an aneurysm is proverbially painful; the radiating pains prevent the patient from sleeping Last year there was a case in an elderly adult who had symptoms of aneurysm without any pain; His serum reaction was strong positive but he had a large number of live children. Radiograms showed destruction of the anterior surface of the bodies of the vertebra with destruction of the cartilage. In a clinical meeting no decision was arrived at when the case was demonstrated.

Post-mortem proved the case to be of aneurysm of thoracic aorta.

In the dorsal region tuberculous disease is more likely to involve a number of vertebrae than in the cervical or lumbar regions.

Angulation may start in the early active stages of the disease; this angulation may continue for years after the lesion has healed and it cannot be arrested by any form of external support.

The difference between upper dorsal and lower dorsal disease :—

In the lower cervical and upper thoracic region the segment of the spine above the lesion falls forward.

If the angulation is sufficient the body of the vertebra above may fall in front of the body of the vertebra below.

In this case the upper and lower segments of the spine do not come into sufficient contact for bony ankylosis to occur between the bodies: The deformity is likely to progress in spite of natural bony fusion of spinous processes or of bony fusion by bone grafting. So severe kyphoses are met with in the upper dorsal region.

In lesions below the 6th dorsal, posterior displacement of the upper segment of the spine occurs.

The bodies of the vertebrae representing the upper and lower segments are brought into contact. Therefore bony fusion of these parts may occur. Prognosis is thus better and kyphosis may become satisfactory.

The after-effects of Angular deformity :—

(1) There is considerable diminution in the size and mobility of the chest;

(2) Interference with heart's action ;

(3) Intense backache in the lumbar region ;

(4) Late onset of paraplegia due to reactivation of the disease or bony pressure in the cord.

2. Treatment is general and local.

Local treatment consists in rest by hyperextension of the spine.

(See paper in Stanley Medical College Magazine—June 1937.)

How does hyperextension differ from simple rest in recumbency ?

(*a*) Treatment in hyperextension decreases the amount of bone destruction. (*b*) Accidents which may occur from flexion of the spine during the active stages of the disease are prevented: hyperextension definitely diminishes paraplegia. (*c*) The bodies of the vertebrae adjacent to the diseased area may show the compensatory overgrowth phenomenon. This overgrowth tends to lessen the gap produced by the bone destruction and is therefore of value in limiting the deformity.

The method used is the Bradford's frame.

How long to continue Hyperextension ?

It must be continued until the disease is quiescent ie., by radiogram it must be determined that bone destruction is at an end for more than six months.

The next stage is to allow the vertebrae to fall together and fuse :—

This is done by nursing the patient on his face in a plaster shell; and at this stage the muscles may be gently rubbed over with alcohol daily.

Development of compensatory curves :—

Compensatory curves are the best insurance against reactivation of the disease and a late increase of the deformity.

The compensatory curves should be as near the lesion as possible; this is done by adequate padding while the patient is on the posterior frame. Compensatory curves should be fully developed before the patient is allowed up ; they must be maintained and the healed lesion protected during ambulatory treatment.

What are the methods of maintaining fusion ?

(*a*) External splinting (Taylor's brace)

(*b*) Internal splinting Albee's spinal fusion; the area fused should include the kyphos and the adjoining compensatory curves.

3. *Contraindications for spinal fusion* :—

(1) Activity of the disease both in children and adults because:

(*a*) there is no consolidation at the site of lesion

(*b*) absence of compensatory curves

(*c*) Operation is severe and may weaken the individual.

(2) Children—no fusion would take place as the spinous processes are partly cartilaginous.

Indications and objects of spinal fusion :—

(1) To protect the newly consolidated lesion from trauma.

(2) To maintain the compensatory curves at their optimum.

(3) To protect the progressive increase of deformity which occurs in adult life especially in dorsal caries; it is in the dorsal region that late paraplegia occurs without recrudescence of the active disease, and which would almost certainly be prevented by fixation of the neural arches.

Spinal fusion is not necessary :—

In lumbar region as the results of conservative treatment are good.

The fusion is not solid in less than three months and the patients must wear a Taylor's brace before he is out of bed.

If the graft absorbs or breaks, it is generally at the site of lesion and this demonstrates that the consolidation of the previously diseased area is not complete.

Paraplegia occurs in 25% of cases and in 5/6 of the paraplegic cases the incidence of early onset and late onset paraplegia is almost equal.

For paraplegia, apart from costo-transversectomy, there is no indication for laminectomy; conservative treatment is enough.

Albee's spinal fusion cases:

MY OWN PERSONAL CASES

1 case died 6 months after operation.

1 case developed paraplegia 3 years after spinal fusion.

4 cases could not be traced.

1 case had fracture at the middle of the graft 6 months after operation but has consolidated now.

1 case 4 years after operation has caries of a rib: the spine has consolidated well.

2 patients are quite well and doing duty.

Costo-transversectomy :—

1 case in an young adult with a large paravertebral abscess and toxic and pressure symptoms; smear examination showed tubercle bacilli; early radiographs taken a year previously did not show destruction of vertebral bodies. The tubercular infection occurred probably in a case of osteo-chondritis of spine.

NOTICE.

WARNING NOTICE TO REGISTERED MEDICAL PRACTITIONERS.

As a number of cases of advertisement by registered medical practitioners in the lay Press and by means of handbills, have come before the Madras Medical Council in recent months, the Council has, at its last meeting held on the 17th April 1939, decided to warn all registered medical practitioners that all kinds of advertisements—including even the opening of private institutions, inviting laymen to attend functions connected therewith and publication of same in lay papers under section 6 by registered medical practitioners will be considered as advertisement of the Warning Notice published by the Medical Council, and will be dealt with accordingly.

(Sd.) N. M. WILSON, MAJOR-GENERAL, I.M.S.,
President, Madras Medical Council.

JOURNAL OF SOUTH INDIAN MEDICINE.

JULY 1939.

OURSELVES.

The Union has been in existence for nearly twenty years and it has gone through many vicissitudes. Whenever the membership thins or finances get lean there are always a few individuals who advise change in the constitution, the reduction of membership fee, or curtailment of its activities. There are others who give exactly the contrary advice that we should increase our activities. But they do not help us with any suggestions for getting the necessary funds. Such periodic difficulties are not unknown elsewhere. All the world over medical societies in common with other associations have had similar experience. Many of the associations have disappeared while a few have been absorbed into other associations and flourish under new names and better organization. Medical societies which are now over a hundred years old have started humbly and have gone through rough weather. They have in their time endured ridicule and experienced neglect. They have had to contend with rival associations and malicious propaganda. Our members and readers of this Journal may therefore ask how then did those organizations outlive all those troubles to compel respect and complete their centenary.

The affairs of the Union are by no means satisfactory at present. In a city where there are over eight hundred practitioners, it is not enough if we have about two hundred members on the roll. And it is still less satisfactory that Medical meetings should not have more than twenty to thirty practitioners to

attend. We say that this is not a satisfactory state. But that is no reason to be pessimistic. For, we remember the late Osler complaining once that in a city where there were more than 100 medical men, there was often difficulty in getting ten people together for meetings. Our object in referring to the affairs of the Union in this issue is to appeal to the practitioners in the City and the moffussil to exert themselves a little to brighten up the affairs. There is not much use in retrospection unless it helps us to advance. Our road is forward. "It is a noble thing to say that your road is forward and it befits a man of battles." So wrote George Meredith. It behoves the practitioners of the city and outside to fight out prejudice and apathy. The medical profession is just now in one of its gloomiest phases. The seniors may be resigned to it. But the junior members have every cause to plan out measures to dispel the gloom. It requires no elaborate argument to believe that it will be easier to win if medical practitioners will get together a little more.

THERAPEUTIC NOTES.

Issued by Malaria Institute of India.

ACTION OF QUININE AND THE SYNTHETIC DRUGS ON MALARIA.

(From 4th General Report of League of Nations Malaria Commission.)

	Action on Trophozoites.		Action on Gametocytes.		Action on acute Symptoms.		Action on frequency of relapse.	Action on Splenomegaly.	Effect on general condition of patient.
	B. T. + Q.	M. T.	B. T. + Q.	M. T.	B. T. + Q.	M. T.			
QUININE ...	Daily dose of 1 g. (15 grs) causes dis appearance, 5-7 days.	Daily dose 1·3 g. (20 grs causes disappearance, 5-7 days.	Affects pre-gametocytes and gametocytes.	Affects pre-gametocytes but gametocytes only very slightly.	Marked action from 3rd day (2nd paroxysm.)	Variable action from 3rd or 4th paroxysm.	Acts on all species but in B. T. and Q. relapse rate may reach 50 per cent.	Acts on all species but effect is transient where re-infection or relapses are frequent.	No effect if treatment is limited to number of days essential.
ATEBRIN ...	Daily dose of 0·3 g. causes disappearance after 3 days. Effects last longer than quinine.	Daily dose of 0·3 g. causes disappearance after 4 days in 90% of cases.	Similar to quinine but slightly more marked.	Similar to quinine.	Very marked action. Fever falls by 2nd paroxysm.	Marked action. Fever usually falls by 3rd paroxysm (but with some strains effect is less than quinine.)	Action slightly more than quinine especially in B. T. and certain strains of M. T.	Effect somewhat slower than quinine but seems to lost longer.	Sometimes yellow coloration of skin.
PLASMO-QUINE.	Slight action only.	Practically no action.	Definite action in both species.	Marked action in minimum doses of 0·02 g.	No indications for using plasmoquine alone for treatment of acute attack.		Definite effect in B. T. and Q. In association with quinine and atebrin it has a marked effect in reducing relapses in all 3 species.	Insufficient data.	In the doses now used (e. g., 0·02 g.) it seems to have no depressing effect.

NOTES

A.—Action of Combinations of Drugs.

1. There is no advantage in combining quinine and 'atebrin' in treatment.

2. Quinine + 'plasmoquine' simultaneously produce less frequent and less intense toxic symptoms than 'atebrin' + 'plasmoquine', but are best given consecutively where possible. Quinine (15-20 grains daily, 7 days) + 'plasmoquine' (0·02 g. daily, 5 days*) are probably the best treatment for B. T. and Q. malaria.

3. Simultaneous administration of 'atebrin' and 'plasmoquine' aggravates the toxicity of each and is not recommended. Consecutive treatment with 'atebrin' (0·3g. daily, 5-7 days) and 'plasmoquine' (0·02 g. daily, 5 days *) has no advantage in the primary attack, but acts on gametocytes and relapses in the same manner as quinine and 'plasmoquine' treatment.

B.—Practical Suggestions For Treatment.

1. *Individual Treatment.*—Quinine (15-20 grains) or 'atebrin' (0·3 g.) 5-7 days, followed by 'plasmoquine' (0·02 g.) 5 days, or quinine + 'plasmoquine' simultaneously.

2. *Treatment in Field.*—Quinine (15-20 grains) or 'atebrin' (0·3 g.) 5-7 days, followed by 'plasmoquine' (0·02 g.) 5 days if funds and medical supervision are available. But if, as is usual, this is not so, short treatments with the cinchona alkaloids are more suitable.

3. *Mass Drug Prophylaxis.*—Daily doses of quinine (0·4 g. or 6 grains), or bi-weekly doses of 'atebrin' (0·2 g.).

---

* For gametocidal purposes alone, however, one dose of 0·02 g. 'plasmoquine' followed by a second dose, if necessary, on the 5th day is equally effective. It may be noted also that in one mass treatment experiment (in Sardinia), the daily administration of 0·02 g. 'plasmoquine' had to be stopped after 3 days on account of toxic symptoms.